

Superfund Program

**Proposed Plan
Ten-Mile Drain Site
St. Clair Shores, Michigan**

November 2013

INTRODUCTION

This Proposed Plan identifies the preferred interim cleanup alternative to address high concentrations of polychlorinated biphenyls (PCBs) discovered at certain locations within the Ten-Mile Drain Superfund Site. Specifically, this Proposed Plan summarizes the various interim cleanup alternatives that were evaluated to address the highly-impacted backfill and vault bedding materials within the Ten Mile drain utility corridor adjacent to four manhole locations, and provides the rationale for the preferred alternative. This document is issued by the U.S. Environmental Protection Agency (EPA), the lead agency for site activities. EPA, in consultation with the Michigan Department of Environmental Quality (MDEQ), the support agency, will select an interim remedy for the site after reviewing and considering all information submitted during the public comment period which runs from **December 4th, 2013** through **January 6th, 2014**. The selected interim cleanup plan, which will be announced in local newspaper notices and presented in an EPA document called an Interim Record of Decision (ROD), could differ from this Proposed Plan depending on information or comments EPA receives during the public comment period. Therefore, members of the public are encouraged to review and comment on all of the alternatives presented in this Proposed Plan. Members of the public are also encouraged to attend and participate in a public meeting at City Council chambers, 27600 Jefferson Circle Drive at 6:30 pm on December 12, 2013.

EPA is proposing that ***Alternative 7: Excavation, Removal and Replacement of Two Vaulted Manholes, M7179 and J01***, be selected to clean up contaminated soil and backfill material from within the Ten Mile drain storm sewer system (TMD system) utility corridor 15 feet under the ground. This alternative would excavate, remove, and replace the two vaulted manholes and the underlying stone bedding and backfill material at the two locations (M7179 and J01) where the highest concentrations of PCBs were found. These measures to remediate the PCB oil and contaminated subsurface soils near and around the bottom of the selected manhole structures will be a protective interim action that provides adequate steps to reduce the volume of PCBs discharging into the Lange and Revere Street canals, will comply with those federal and state requirements that are applicable or relevant and appropriate for this limited-scope action, and will be cost effective.

EPA is managing the contamination at the Ten-Mile Drain Site through a phased approach. The remedy recommended by this Proposed Plan would be the second interim remedial action at the site. In September 2011, EPA signed an Interim ROD to address the accumulation of PCB contamination behind a series of weirs or small dams that were installed inside portions of the TMD system pipe during a prior EPA removal action. The second interim remedial action proposed in this document would further mitigate the discharge of PCB contamination into the

Lange and Revere Street canals by preventing the high concentrations of PCBs currently located beneath the manhole vaults at M7179 and J01 from entering into the TMD system pipe and migrating to the canals. These interim measures are intended to prevent further environmental degradation while EPA continues through the remedial process and until a final remedial action is selected and implemented at the site. EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in the September 2013 *Focused Feasibility Study Report*, the January 2012 *Source Area Investigation Report*, and other documents contained in the Administrative Record file for this site. EPA and MDEQ encourage the public to review these documents to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted at the site to date. The public is encouraged to review the supporting documents for the Ten-Mile Drain Superfund Site at the following locations:

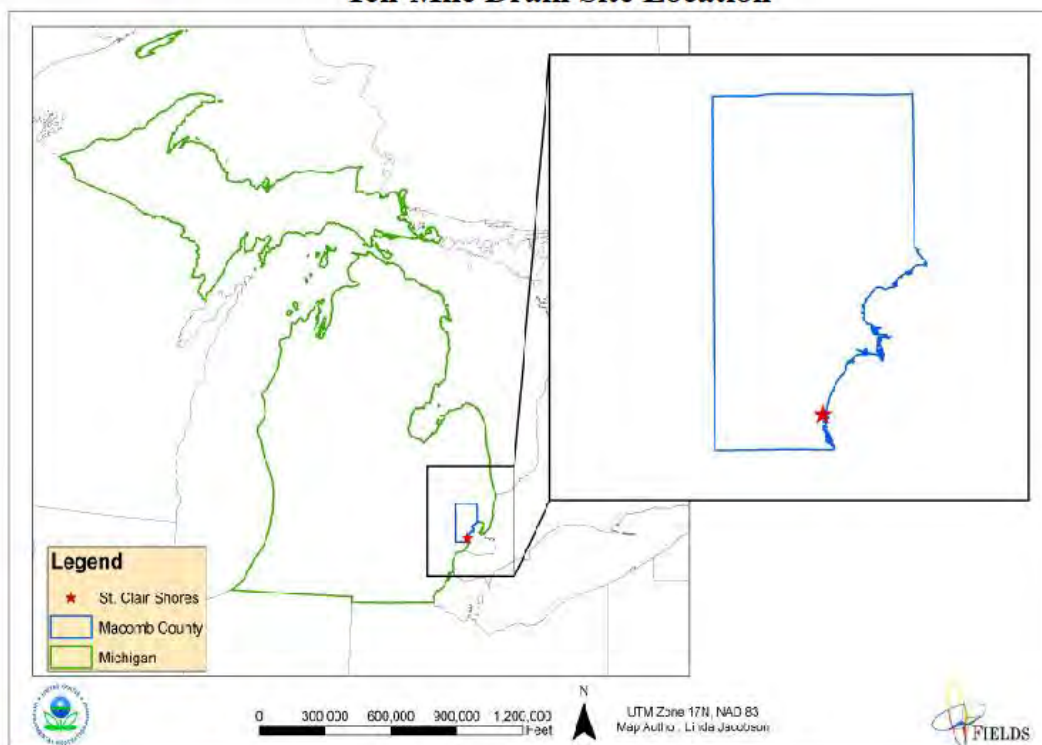
St. Clair Shores Public Library
22500 E. 11 Mile Rd
St. Clair Shores, IL 48081
(586) 771-9020
Call for Hours

EPA Region 5 Records Center
77 W. Jackson Blvd.
Chicago, IL 60604
(312) 353-1063
Mon-Fri - 8 am to 4 pm (central time)
Call for appointment

SITE BACKGROUND

The Ten-Mile Drain Site is located northeast of the City of Detroit and on the western shores of Lake St. Clair in St. Clair Shores, Macomb County, Michigan (see Figure 1).

FIGURE 1
Ten-Mile Drain Site Location



The site is located in a mixed commercial/residential area near the intersection of Bon Brae Street and Harper Avenue. It includes a portion of the Ten Mile drain storm sewer system, which consists of concrete sewer pipes and backfill material surrounding the pipes in a utility corridor 15 feet below ground surface (bgs). The site covers several blocks where PCBs have been found in the storm sewer system in significant concentrations. The PCBs are moving into and through the storm sewer, which empties into two canals – the Lange and Revere Street canals – connected to Lake St. Clair. The canals, which provide recreational boating access to Lake St. Clair for approximately 125 homes (see Figures 2 and 3), are private property and are used for recreational boating, swimming, and fishing.

FIGURE 2
Ten Mile Drain Storm Sewer System

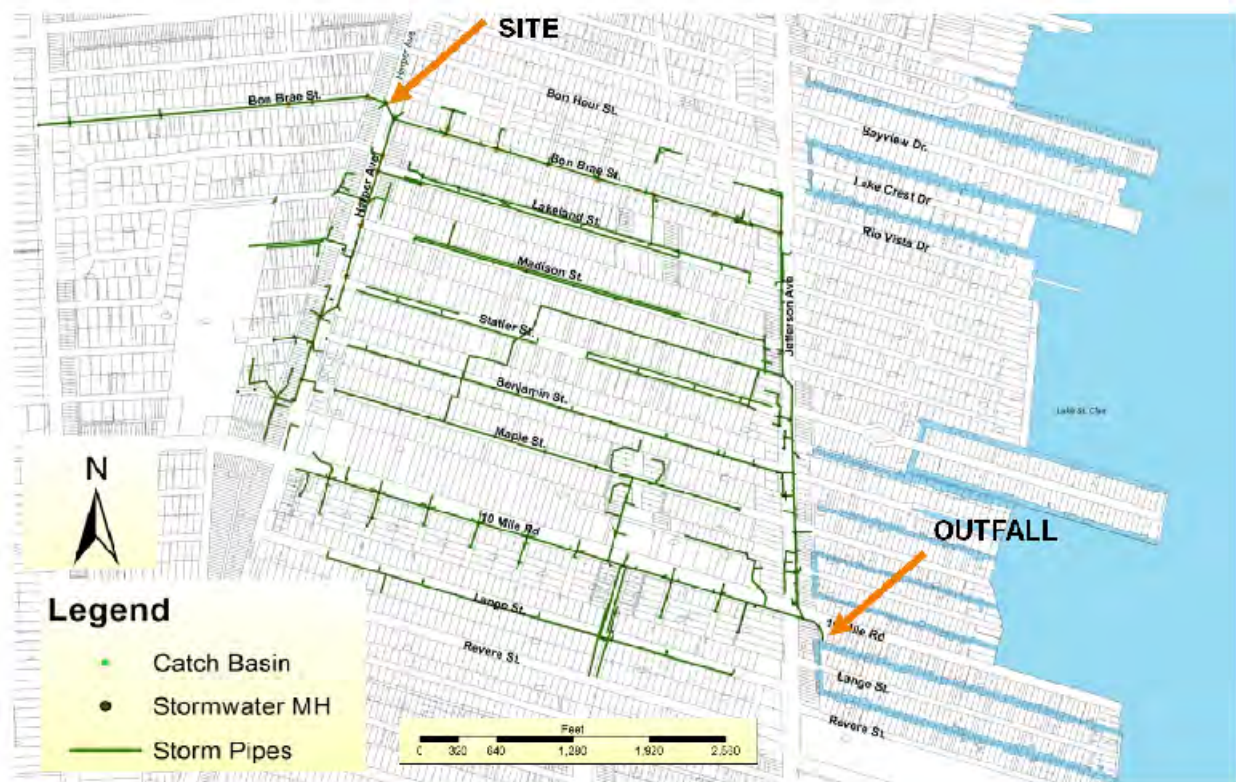


FIGURE 3
Lange and Revere Street Canals (outfall)



Over the past twelve years, several removal actions and associated investigations have taken place since PCBs were discovered in the drain in 2001. This section of the Proposed Plan provides the history of the site and a brief discussion of the various removal, remedial, and enforcement activities and associated investigations that have been conducted at the site.

History of Removal Activities and Investigations (2001-2006)

In July 2001, sediment samples were collected by the Macomb County Public Works Office (MCPW) as part of a permit application process for a proposed dredging project in the Lange and Revere Street canals. The analytical results were submitted to the U.S. Army Corps of Engineers, who then notified MDEQ based on the elevated levels of PCBs in the sediment. In December 2001, MDEQ conducted an investigation of the Ten Mile drain storm sewer system and confirmed there was an upstream source of PCB contamination in the drain. As a result of MDEQ's investigation, MCPW sampled and confirmed the presence of PCBs in both the Lange and Revere Street canals and Ten Mile drain storm sewer system.

EPA's removal program initiated a time-critical removal action at the site in August 2002 and completed the work in July 2004. During the removal action, high concentrations of PCB-contaminated sediments were removed from the Ten Mile drain storm sewer system, the Revere

Street canal, and the connecting channel between the Revere and Lange Street canals. All waste was transported for disposal at approved off-site facilities. Specifically, the following activities were completed:

- Development and implementation of a site-specific Health and Safety Plan and Air Monitoring Plan;
- Development and implementation of a Site Security Plan including guard services, installation of signs on gates, and temporary fencing;
- Dewatering the Ten Mile drain storm sewer system and removal of all sediments via confined space entry and high-pressure jet-vacuum truck;
- Construction of an on-site water treatment system and treatment of approximately 2.5 million gallons of water. Water treatment system operations included the dewatering of the Wahby Park Pond and sampling of the sediments;
- Installation of sheet piling to create excavation cells, and replacement of any sections of sea walls that failed after dewatering due to removal activities;
- Excavation of all sediments with PCB concentrations exceeding 10 parts per million (ppm) from the Revere Street canal and the connecting channel between the Lange and Revere Street canals, with the goal of achieving an average sediment concentration of 1 ppm;
- Development and implementation of a confirmation sampling plan during the excavation phase of the project. In the event that the confirmatory sampling demonstrated that the 1 ppm goal was not met, additional excavation and confirmatory sampling was required;
- Off-site disposal of all PCB-contaminated sediments at an EPA-approved disposal facility in accordance with the EPA Off-Site Rule (40 CFR § 300.440); and
- Restoration of any areas damaged due to EPA's actions.

In total, EPA disposed of approximately 5,900 tons of PCB-contaminated materials and 18,000 tons of non-hazardous materials. Post-removal site controls were agreed to by MCPW. In April 2004, MCPW completed the re-cleaning of the drain and the outfall area where the sewer lines empty into the canals.

In June 2004, MCPW initiated quarterly PCB sampling in the drain. Based on the results, PCBs were still present at levels as high as 1.3 ppm in the drain water. At the time, such concentrations were believed to be residual contamination. In July 2004, MCPW initiated a Phase I-type assessment of the Harper Avenue and Bon Brae Street area. In September 2004, MCPW completed the second round of quarterly PCB sampling and detected PCBs in sediment at the outfall of the drain at 770 ppm. In December 2004, MCPW conducted the third round of PCB sampling in the drain and detected PCB concentrations as high as 17,000 ppm. After the

third round of sampling, MCPW initiated soil boring sampling of the backfill surrounding the drain to attempt to determine if a source of PCBs was re-contaminating the drain. Results indicated that PCBs were present in backfill surrounding the drain at levels as high as 41,000 ppm. In January 2005, MCPW collected sediment samples from inside the drain near the intersection of Harper Avenue and Bon Brae Street and detected PCBs at extremely high concentrations, up to 200,000 ppm.

In May 2005, EPA's removal program and MDEQ installed 64 additional soil borings in the suspected source area to attempt to better define the extent of PCB contamination. PCBs were detected in the sand and gravel backfill surrounding the drain and appeared centered in the area near the intersection of Harper Avenue and Bon Brae Street. The May 2005 investigation also revealed one surface soil area contaminated with PCBs at approximately 800 ppm. In the spring and summer of 2006, EPA conducted another removal action to address this area of surface soil contamination. Specifically, the following activities were completed:

- Removal and restoration of PCB-contaminated shallow surface soils;
- Repair of sea walls;
- Removal of sediment from a portion of the sewer system;
- Installation of monitoring wells and a large sediment trap to collect contaminated sediment in the drain at the outfall; and
- Installation of a cured-in-place pipe (CIPP) liner in a portion of the sewers along Bon Brae Street and Harper Avenue to attempt to mitigate PCB infiltration from the backfill materials into the sewers.

City of St. Clair Shores and EPA Removal Activities (2007-2011)

In the fall of 2007, MDEQ provided a \$500,000 grant to the City of St. Clair Shores for further investigation and cleanup efforts. The City hired Environmental Consulting & Technology (ECT) as its contractor for this work. Four main tasks were performed under this grant: environmental sampling to monitor the conditions in and around the drain; installation and maintenance of monitoring wells along the drain; cleaning contaminated sediment from portions of the drain; and installation of two weirs within the drain to slow the migration of PCBs to the canals and Lake St. Clair. Weirs are half-circle metal structures approximately two feet high that act like small dams to collect PCB oil and contaminated sediment before the contaminants move into the canals.

In late 2009, ECT discovered oil inside the CIPP-lined portion of the sewer located at the Bon Brae Street and Harper Avenue intersection that contained more than 80 percent PCBs (i.e., more than 800,000 ppm). The City and ECT asked for assistance from EPA in addressing this almost-pure chemical waste in the drain. EPA and the City identified immediate and time-critical concerns for the need to eliminate the potential for PCBs to migrate down the storm sewer and threaten the Lange and Revere Street canals. In March 2010, EPA mobilized its removal action contractors to the site to initiate removal action activities, which included the following:

- Dewatering and high-pressure jet-vacuuming of the sewer along Bon Brae Street and down Harper and Jefferson Avenues to remove PCB oil and sediment;
- Stabilization, transportation, and off-site disposal of the PCB-contaminated materials;
- Installation of temporary weir structures in 15 manhole locations to allow sediment collection points (see Figure 4). The 15 weirs joined the two weirs previously installed in the drain system by the City of St. Clair Shores; and
- A geophysical survey of the area near the sewer where contamination was present, and advancement of soil borings and collection of soil samples from suspected source areas.

Based on subsequent environmental sampling results collected by the City, EPA conducted another removal action at the site in late February 2011 to remove PCB oil from the drain. Absorbent snares were used to swipe and soak up the oil that had collected behind the weirs. A total of six of the seventeen weir locations required cleanout and one 55-gallon drum of soiled absorbent snares was collected for disposal. Clean snares were then attached to weighted chains and left directly upgradient of selected weirs to allow any new incoming oil to collect on them and to support future sample collection and removal efforts. Because PCB oil continued to infiltrate the drain and as part of their environmental monitoring activities, in April 2011 the City inspected the absorbent snares, removed soiled snares, and placed clean snares behind the weirs where needed. MDEQ's grant to fund the City of St. Clair Shores' investigations and cleanup efforts at the Ten-Mile Drain Site expired in September 2011.

EPA and MDEQ Remedial Activities

MDEQ conducted a Site Investigation in July 2008 to document and obtain sufficient data to support listing the site on the National Priorities List (NPL). EPA proposed the site for the NPL in March 2010 and finalized the site on the NPL in September 2010.

In September 2011, EPA selected an interim remedial action to address the high concentrations of PCB oil and contaminated sediments that continued to accumulate behind the weirs. This first interim action consists of monthly monitoring and removal of materials from behind the weirs, and is intended to prevent additional PCB contamination from reaching the nearby canals until such time as a final cleanup plan is selected and implemented for the site. Interim source control activities are ongoing and will continue for as long as necessary until a final remedial action for the site is selected and implemented.

In August 2011, EPA designed and conducted a sediment sampling project in the Lange and Revere Street canals. Approximately 100 samples collected from the surface of the sediments and 40 samples collected from deeper sediments were analyzed for PCBs by an EPA mobile laboratory to characterize the contamination in the canals and provide information to explain the elevated PCB levels found in fish caught in the canals. Based on the findings of the 2011 sediment sampling event, the highest PCB concentrations (100 ppm to 570 ppm) are located near the outfall of the Ten Mile drain storm sewer system. Overall, EPA found that PCB concentrations decrease with depth and distance from the outfall. PCB concentrations are significantly lower in the deeper, clay sediment materials than the surficial, silty sediment

materials. EPA found the highest PCB concentrations on the western ends of the canals, which indicates that PCBs continued to discharge out of the Ten-Mile Drain outfall into the Lange and Revere Street canals following the 2002-2004 removal action that excavated contaminated sediments from the canals.

In April 2011, EPA began its Source Area Investigation fieldwork in an attempt to find the source of the high PCB concentrations that were continuing to infiltrate the Ten Mile drain storm sewer system. The investigation focused on the sanitary sewer, gas, and water main utility corridors that crossed the TMD system utility corridor, which potentially could provide preferential pathways for PCB contamination to migrate into the drain. Utility lines are typically set in corridors backfilled with stone and other “loose” materials through which contamination could easily migrate. The native materials at the Ten-Mile Drain Site are generally very tight clays which do not allow easy migration of contamination. EPA believed that if contamination was present within these other utility corridors that cross the TMD system, the contamination could then be traced back to the potential source area. The Source Area Investigation also included additional sampling within the TMD system utility corridor.

EPA finalized its *Source Area Investigation Report* in January 2012. The results of the extensive investigation found significant concentrations of PCB oil within the TMD system utility corridor backfill materials adjacent to four vaulted manhole locations: J01, M7179, M4335, and M7183. Importantly, only very low PCB concentrations were found in the backfill materials of the other utility corridors, ruling out the sanitary sewer, gas, and water main utility corridors as a source or conduit for the high PCB concentrations found at the Ten-Mile Drain Site. Additionally, PCBs were found in all depth intervals of the backfill materials near the intersection of Bon Brae Street and Harper Avenue, between Bon Brae and Lakeland Streets. The information gained during the investigation lead EPA to believe that a historical release (or releases) of PCBs entered the storm sewer system, either from a surficial spill or illegal dumping activities, and that the PCBs, which are denser than water, ended up sinking to the lowest points in the system – the vaulted manhole locations. Based on all the information available at this time, EPA believes that these PCBs in the stone bedding and backfill materials at the base of the vaulted manholes appear to be serving as the current source of contamination to the Ten Mile drain storm sewer system and the Lange and Revere Street canals. The source or cause of the initial release(s) of PCBs into the system may never be identified, although EPA will continue to follow all leads and critically examine all data gathered during its investigation work at the site.

In April 2013, EPA began its site-wide remedial investigation field work. EPA is collecting samples from all other areas potentially impacted by the site, including soils from residential and commercial properties along the canals and near the storm sewer drain.

Enforcement Activities

So far, EPA has been unable to identify a Potentially Responsible Party (PRP) linked to the PCB contamination at the site, but the search is ongoing. Between 2002 and 2005, EPA conducted various civil investigations. EPA located and interviewed individuals, and reviewed documents, plats, aerial overviews, building permits, and on-line databases. EPA sent an information request letter to DTE Energy in October 2003 as part of its PRP search activities. A follow-up information request letter was sent to DTE Energy in May 2011. During public meetings, EPA

has also encouraged the public to come forward with any information that might provide useful clues to what may have caused the PCB release at the site. EPA civil investigators continue to follow up on all information identified during the field investigation work and/or brought forward by the public.

SITE CHARACTERISTICS

This section of the Proposed Plan summarizes the current information available about site characteristics. EPA is currently in the early stages of the site-wide remedial investigation/feasibility study (RI/FS), so the nature and extent of contamination, potential transport pathways, and environmental receptors have not yet been fully characterized. This information will be provided in and be the focus of the RI report for the site, when it is available.

Contaminants of Concern

PCBs are the contaminants of concern in soil, sediment, and water. Since 2001, PCBs have been known to contaminate the TMD system, the soils and water immediately surrounding the TMD pipe in the utility corridor, and the sediments in the Lange and Revere Street canals at the outfall of TMD system. PCBs are a group of fabricated chemicals originally used in industrial processes and products such as coolants and lubricants. In 1977, PCB production was banned in the United States, but PCB mixtures remain in old electrical equipment and other items, and there is also substantial PCB contamination in landfills and rivers. PCBs can pose potential health risks through eating contaminated food, soil or water, through direct contact, or through breathing PCB-contaminated air or particles. One of the main exposure pathways of concern at sites with PCB contamination in sediments is human ingestion of PCB-contaminated fish. EPA considers PCBs as possible cancer-causing chemicals.

Physical Characteristics

The Ten-Mile Drain Site is located 13 miles northeast of downtown Detroit in St. Clair Shores, Michigan. The site includes a portion of the Ten Mile drain storm sewer system near the intersection of Bon Brae Street and Harper Avenue where elevated levels of PCBs have been documented in the drain and the soil surrounding the drain since 2001. The Ten Mile drain storm sewer, located approximately 15 feet bgs, is a network of storm sewers and catch basins constructed in 1967 that collect and manage storm water runoff. The drain pipe is an average of 6 feet wide (8 feet wide at the outfall) and empties into the Lange and Revere Street canals, which are connected to Lake St. Clair. (See Figure 2.)

Geology

Available information indicates the primary presence of fine-grained deposits with interbedded lenses of coarser grained materials comprising the native soils surrounding the Ten Mile drain utility corridor. Geological materials around the drain are comprised of sand, clay, silty clay, sandy clay, and clayey sand zones extending to a depth of approximately 15 feet. In general, the Ten Mile drain utility corridor is set within the native clay soils and is comprised of an enclosed concrete storm sewer system set within fill materials of varying composition.

Hydrological Conditions

Groundwater monitoring wells were installed during the 2005 removal site investigation and as part of the City of St. Clair Shores' environmental monitoring plans. During EPA's Source Area Investigation and previous investigations, borings installed in the native clay soils located outside the TMD system and other utility corridors determined that no groundwater aquifer is present within 20 feet of ground surface. Available information indicates that hydrogeologic materials are comprised of fine-grained aquitard materials with poorly connected, interbedded water-bearing coarse-grained units encountered at varying depths.

Storm Drain Hydraulics

There is low topographic relief in the vicinity of the TMD system and water is continually present within the TMD system. The TMD system outfall is 8 feet in diameter, is located in the Lange Street canal, and is always partially submerged in the canal. Wind direction causes water level fluctuations (seiches) along the shoreline of Lake St. Clair. The changes in water levels directly affect the water levels within the TMD system. Under normal conditions, water within the TMD system flows from inland areas to the east, out into the Lange and Revere Street canals. However, on-shore winds can cause the water levels to increase in the canals, causing water flow in the TMD system to reverse. Under these conditions, water flows from the canals into the TMD system.

The TMD system is constructed with jointed reinforced concrete pipe 4 to 6 feet in diameter, and is located between 6 and 12 feet bgs. The jointed concrete construction appears to allow water to pass through the joints of the drain causing both infiltration and exfiltration of water in the backfill materials surrounding the pipe to flow into and out of the TMD concrete pipe. Water levels in the transmissive sand and gravel backfill equalize with the water levels inside the drain. The average water level within the TMD backfill material is between 5 and 8 feet bgs.

Vaulted Manholes

The vaulted manholes were installed as cast-in-place concrete (location J01) or precast concrete (locations M7179, M4335, and M7183) and finished to surface grade with bricks. It should be noted that J01 is actually a junction box with manhole access that is situated to the "side" of the junction box and not directly over the line of flow. The reason for the J01 junction box is that several lines feed into the box from various angles not allowing the point to be constructed with a traditional vaulted manhole. For simplicity, J01 is referred to as a vaulted manhole throughout this document.

Extent of PCB Contamination

EPA is currently conducting the site-wide RI, so the nature and extent of PCB contamination at the site has not yet been fully characterized. Historical releases of PCBs into the TMD system likely resulted in the current secondary source areas of PCBs within the backfill material around certain vaulted manholes within the TMD system. Potential source areas other than the impacted fill material around the TMD vaults were not identified during the Source Area Investigation. Based on the fact that PCBs were found at all depth intervals in the fill materials near the intersection of Bon Brae Street and Harper Avenue, between Bon Brae and Lakeland Streets, it appears that the initial release of PCBs into the TMD system was due to a surficial spill or illegal dumping activities near that area. EPA will continue to investigate the nature and extent of contamination during the site-wide remedial investigation.

Conceptual Site Model

A conceptual site model (CSM) has been developed for the Ten-Mile Drain Site based on site characteristics and results from the various investigations summarized above. The CSM is used to organize and communicate information about site characteristics. The CSM tells the story of how and where the PCB contamination is expected to move and what impacts such movement may have.

Once in the ground, the PCBs at the site follow a preferential pathway through the TMD utility corridor. Native soils in the area are dense, semi-impermeable clay to silty clay that does not readily transmit water or other liquids. The soils observed in the utility corridor borings were either disturbed native soils or imported backfill materials until the native soils beneath the utility corridors were encountered. PCBs were not detected in any samples collected from within the native clay. Therefore, the most likely migration pathway for the PCB contamination is the more transmissive, disturbed native soils and/or imported fill materials in the backfilled utility corridors. The bottoms of the manhole vault structures are lower in elevation than the concrete pipe portions of the TMD system, which creates a low point for contaminants and water to accumulate around the base of the vaults. As a result, PCBs, which are denser than water, have accumulated on the outside of the TMD pipe around the bottom of four vaults: J01, M7179, M4335, and M7183.

Due to the hydraulic connectivity between the TMD storm sewer pipe and the TMD utility corridor, PCBs are re-impacting the sediment and water inside the pipe. The movement of water in and out of the TMD utility corridor through the joints in the piping along Bon Brae Street and Harper Avenue causes the PCB oil that has accumulated at the bottom of the vaulted manholes to continue to re-enter the drain. During storm events, flow turbulence is increased in the vaulted manholes, causing sediment and other organic particles impacted with PCBs to mobilize within the TMD system. Figures 5a and 5b depict this movement of PCBs from the vault areas in and out of the TMD system.

Principal Threat Wastes

EPA has defined principal threat wastes as those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or that would present a significant risk to human health or the environment should exposure occur. The high concentrations of PCBs present in the backfill and bedding materials surrounding the manhole vaults are considered principal threat waste.

SCOPE AND ROLE OF THE INTERIM ACTION

EPA is managing the contamination at the Ten-Mile Drain Site through a phased approach. A phased approach to site cleanup is appropriate when site characterization is not yet completed, or when site data are not sufficient to develop and evaluate cleanup alternatives to address risks posed by the entire site, but when action clearly needs to be taken to prevent further migration of contaminants or further environmental degradation.

In September 2011, EPA issued an Interim ROD for the first interim remedial action at the site. That interim action addresses the accumulation of PCB contamination behind the weirs that were installed inside portions of the TMD storm sewer system during a prior EPA removal action. The monthly source control activities required by the first interim remedial action are ongoing and necessary, but only address the PCB materials that have already entered inside the pipe and accumulated behind the weirs; they do not address the source materials located in the backfill materials beneath the vaulted manholes and do not prevent those source materials from infiltrating into the TMD system pipe.

The remedy recommended by this Proposed Plan would be the second interim remedial action at the site, and is intended to address the high concentrations of PCBs in the backfill and vault bedding materials that EPA believes are serving as the current source of PCBs to the rest of the TMD system and the Lange and Revere Street canals. This interim action is intended to mitigate the infiltration and migration of that contamination into the TMD system pipe and the canals until such time as EPA selects and implements a final remedy for the site. This interim action will neither be inconsistent with, nor preclude, implementation of a final site remedy.

SUMMARY OF SITE RISKS

The remedy recommended by this Proposed Plan represents an interim action taken early in the remedial investigation process to prevent further migration of site contaminants and further environmental degradation. Neither a formal RI/FS report nor a human health or ecological risk assessment are available. Ecological and human health risks associated with the site, as well as the ultimate cleanup objectives, will be further evaluated and addressed in a future decision document. PCB oil that has accumulated in the backfill and vault bedding materials at the base of the four vaults continues to re-enter the TMD system pipe. The contaminated bedding and backfill material acts as a continuing source of contaminants to the drain and, ultimately, the Lange and Revere Street canals.

PCBs can pose potential health risks through incidental ingestion of contaminated soil or water, consumption of contaminated fish, by direct skin contact, or through breathing PCB-contaminated air or particles. Although recent sediment sampling data shows that the canal sediments have already been re-contaminated by PCBs since the 2002-2004 removal action, EPA believes it is imperative to prevent further environmental degradation. If left unaddressed, the PCB source materials beneath the manhole vaults could continue to enter the TMD system pipe and migrate to the canals, creating even more widespread contamination of the canal sediments and leading to significantly more expensive costs for the final site remedy.

This section summarizes the data currently available, based on EPA's *Source Area Investigation Report* and monthly source control activities.

The 2011 *Source Area Investigation Report* indicated that the high PCB concentrations in samples collected from the backfill of the TMD utility corridor are capable of re-impacting the sediment and water inside the TMD pipe. An oily sheen was observed on samples collected adjacent to four vaulted manholes. During soil sampling at depths 10 to 15 feet bgs, PCBs

exceeding 1,000 ppm¹ were detected in samples from the backfill and bedding materials adjacent to the four vaulted manholes as follows:

<u>Location</u>	<u>Concentration</u>
M7179	66,000 ppm
J01	39,000 ppm
M4335	1,500 ppm
M7183	3,500 ppm

Two of the vaulted manholes (M7179 and J01) are located near the intersection of Bon Brae Street and Harper Avenue, and the other two vaulted manholes are located east of Harper Avenue on Bon Brae Street, at the intersection of Bon Brae Street and E Street (M4335) and between E Street and B Street (M7183) (see Figure 6).

Monthly source control activities include not only *monitoring* of PCB oil and contaminated sediment behind the 17 weirs within the TMD pipe and at the outfall, but *removal* of the contamination that is found. Sediment removal is generally conducted behind any weir or at the outfall sediment trap if the depth of the sediment is sufficient that it is recoverable from the drain. If visual observation reveals the presence of oil behind the weirs, absorbent snares are used to wipe up and absorb the oil and the soiled snares removed. After the oil is removed, clean absorbent snares are placed in the drain directly upgradient of the selected weir or the sediment trap at the outfall.

As shown in Figure 7, monitoring data collected from behind the 17 weirs inside the TMD pipe between January 2013 and September 2013 tracked sediment concentrations and tested for the presence of PCB oil. If either sediment or oil was present, it was sampled and analyzed for PCBs, and all samples were found to contain PCBs. PCB concentrations found in the sediment collected from behind the weirs ranged from less than 10 ppm to the highest concentration of 210,000 ppm in M7179 at the intersection of Bon Brae Street and Harper Avenue. Overall, less than two inches of sediment has accumulated behind the weirs since the April 2010 removal action when the drain was last dewatered and cleaned. The PCB oil caught behind the weir at M7179 tested as high as 390,000 ppm, and a swipe sample from the bottom of the pipe behind the weir tested as high as 470,000 ppm. These concentrations were removed as soon as they were discovered. PCB oil is consistently found at eight weirs along Bon Brae Street and Harper Avenue.

There is no current human exposure to the PCB oil or contaminated sediment in the TMD system, which is located approximately 15 feet bgs. However, sediments in the Lange and Revere Street canals are contaminated with PCBs from past releases from the drain. EPA conducted sediment sampling in the Lange and Revere Street canals from August 23 to September 1, 2011. The results showed that the highest PCB concentrations in the canal sediments (100 ppm to 570 ppm) are located near the Ten-Mile Drain outfall at the western ends of the canals. Overall, PCB concentrations decreased with depth and distance from the outfall. EPA found that PCB concentrations are significantly lower (10 ppm to 34 ppm) in the deeper

¹ Based on professional, technical judgment, EPA decided to use a PCB concentration threshold of 1,000 ppm as an indicator of materials that could act as a continuing source to the rest of the TMD system.

sediment (usually comprised of clay materials) than the surficial sediment (usually comprised of silty materials). The fact that the highest PCB concentrations are located on the western ends of the canals near the outfall indicates that PCBs continued to discharge out of the Ten-Mile Drain outfall into the canals following the 2002-2004 removal action that excavated contaminated sediments from the canals.

In May 2011, the Michigan Department of Community Health (MDCH) issued a “do not eat” advisory for fish taken from the Lange and Revere Street canals. As a further precaution, MDCH recommends that no one eat carp or catfish caught from Lake St. Clair. These advisories are listed in the *2011 Michigan Fish Advisory* and can be accessed at www.michigan.gov/eatsafefish. PCBs are a concern because they concentrate in the environment and the food chain, resulting in health hazards to humans, fish and wildlife.

This proposed interim action does not directly address the sediments or fish in the canals but is intended to help prevent further environmental degradation by controlling the high-concentration PCB source materials adjacent to the manhole vaults.

Interim Remedial Action Objectives

Remedial action objectives (RAOs) provide a general description of what the cleanup is expected to accomplish and typically serve as the design basis for the remedial alternatives under consideration.

The high concentrations of PCB oil in the backfill and bedding materials adjacent to four vaulted manhole locations appear to be serving as the current source of PCB contamination to the TMD system. EPA believes that source control actions need to be taken to prevent further migration of the contaminants and further environmental degradation. EPA has therefore identified the following remedial action objective for this interim remedial action:

- Mitigate the migration of PCB contamination and prevent further environmental degradation of the Lange and Revere Street canal sediments by reducing the infiltration of PCB oil, contaminated utility trench water, and impacted backfill and vault bedding materials into the TMD system pipe.

SUMMARY OF REMEDIAL ALTERNATIVES

Remedial alternatives that were evaluated for the proposed interim remedial action at the Ten-Mile Drain Site are summarized below. The alternatives are numbered to correspond with the numbering system used in September 2013 Focused Feasibility Study Report. Additional details about the alternatives are provided in the Focused FS Report.

Remedial Alternatives

The following seven remedial alternatives for this interim action were evaluated in the Focused FS Report:

- **Alternative 1 - No Action**
- **Alternative 2 - Grouting of Backfill Materials and Installation of a Liner in Each of the Four Vaulted Manholes**
- Alternative 3 - Abandonment-in-Place of a Section of the Existing TMD System and Installation of a New Line
- **Alternative 4 - Excavation, Removal, and Replacement of Four Vaulted Manholes**
- Alternative 5 - Excavation, Removal, and Replacement of Four Vaulted Manholes and a Section of the Existing TMD System
- Alternative 6 – Use of VeruTEK Surfactant to Mobilize, Extract, and Remove PCBs, and Installation of a Cured-in-Place Lining in the Four Vaulted Manholes
- **Alternative 7 - Excavation, Removal, and Replacement of Two Vaulted Manholes, M7179 and J01**

In accordance with EPA guidance, the potential remedial alternatives identified in the Focused FS and listed above were screened against three broad criteria: effectiveness (both short-term and long-term), implementability (including technical and administrative feasibility), and relative cost (including capital and operation and maintenance [O&M] costs). The purpose of the screening evaluation was to reduce the number of alternatives chosen for a more thorough analysis. As a result of this screening process, EPA eliminated several alternatives from further consideration. Alternative 3 and Alternative 5 were eliminated because they are not considered cost-effective for the limited scope of this proposed interim action. Alternative 6, which included the injection of a VeruTEK surfactant, a relatively new technology, was eliminated after the results of a bench study indicated that this in-situ treatment technology would not be effective for the particular situation that needs to be addressed at this site.

The four remedial alternatives highlighted in bold above were retained for detailed analysis. These four alternatives for cleaning up the highly-impacted backfill and bedding materials at the base of the vaulted manholes were evaluated against eight of the nine criteria required by Superfund law. (See the “*Explanation of the Nine Evaluation Criteria*” section below.) The alternatives will be further evaluated against the ninth criterion – Community Acceptance – following the public comment period for this Proposed Plan.

The four alternatives that were retained for detailed analysis are summarized below.

Alternative 1: No Action

Regulations governing the Superfund program require that the “no action” alternative be evaluated to generally establish a baseline for comparison. Under this alternative, EPA would take no further action at the site (besides the ongoing interim actions selected by the September 2011 Interim ROD). There would continue to be contact between the water within the TMD system and the source materials below the vaulted manholes, and high concentrations of PCBs would continue to infiltrate into the TMD system pipe.

Estimated Capital Cost: \$0

Estimated O&M Cost: \$0

Alternative 2: Grouting of Backfill Materials and Installation of a Liner in Each of the Four Vaulted Manholes

Alternative 2 would decrease the mobility of the PCBs through the use of solidification, and would mitigate the migration of the PCBs by eliminating contact between the water within the TMD system and the source materials below the vaulted manholes through containment. A sketch depicting Alternative 2 (at a single vaulted manhole) is shown in Figure 8. The major elements of Alternative 2 include the following:

- The backfill materials at each of the four vaulted manholes (M7179, J01, M4335, and M7183) would be solidified by grouting. The grout would be applied in the backfill on all sides and beneath the manhole vaults to sufficient depths above and below the source material in order to significantly reduce the PCB mobility. This technology is not reversible as it results in a solidified mass.
- A shotcrete liner or cured-in place liner would be installed in each of the four vaulted manholes in order to eliminate contact between water within the TMD system and the source materials below the vaulted manholes. The liners would not only reline the vaulted manholes, but also would extend laterally 10 feet into each pipe that enters into each of the vaulted manholes.
- Prior to installing the liner, the vaulted manholes would be dewatered, and stormwater would be temporarily rerouted.
- Each vault would be power-washed and cleaned prior to shotcrete application.
- Any contamination located in the trench backfill materials between one vaulted manhole location and another would be left in place.
- Monitoring of trench water would be accomplished through monitoring wells placed in the utility trench adjacent to the newly grouted manholes and through wipe samples taken within the vaulted manholes. Two wells would be placed on either side of the four manholes for a total of eight monitoring wells. Sampling of the wells and the wipe

samples from the vaults would occur quarterly. EPA would evaluate the effectiveness of the wipe sample collection method and adjust it as deemed necessary. EPA would also adjust the frequency of the monitoring and sampling events as deemed necessary.

- The monitoring wells outside the manhole vaults would be used to extract PCB oil if build up of oil against the solidified backfill materials was observed. The monitoring wells would also provide data to support future decisions about a site-wide remedial action.
- Monitoring inside the drain would be performed in order to assess if free oil had been reduced or eliminated compared to the conditions that existed prior to grouting.
- Institutional controls would include both deed restrictions and assigning permit restrictions to accompany the deed restrictions. Deed restrictions would be necessary to restrict land use in order to ensure that source area grouted soils are not brought to the surface during future excavation activities or grout being damaged below grade without adequate safeguards.

Estimated Capital Cost (Design, Geotechnical Investigation and Construction): \$1,800,000

Estimated Construction Time: 3 weeks

Estimated Time to Achieve Remedial Objectives: Immediately upon completion of construction

Estimated Truck Trips: No excavation or clean-fill truck trips required

Estimated Annual O&M Cost (30 years): \$111,504

Total Present Value: \$3,700,000

Alternative 4: Excavation, Removal, and Replacement of Four Vaulted Manholes

Alternative 4 would reduce the volume of contamination and mitigate contaminant migration through excavation and removal of source materials and through infrastructure modifications at each of the four vaulted manholes. A sketch depicting Alternative 4 (at a single vaulted manhole) is shown in Figure 9. The major elements of Alternative 4 include the following:

- Excavation and removal of the four vaulted manholes (M7179, J01, M4335, and M7183) and the surrounding impacted backfill materials, and proper off-site disposal of the contaminated materials.
- Prior to excavation, the vaulted manholes would be dewatered, and flow in the TMD system would be temporarily rerouted with pumps.
- Four new vaulted manholes would be installed to replace the excavated vaulted manholes, including new stone bedding and backfill materials.
- Prior to installing the new vaulted manholes, a flexible synthetic liner would be installed on the open excavation surface to separate the existing soils from the new clean bedding and backfill materials.
- The flexible synthetic liner would be bolted to the outside of each new manhole vault using batten strips.

- Treatment of excavated impacted soils through solidification would occur prior to disposal by mixing a reagent (cement kiln dust) to convert the sludge to a granular solid and improve the handling characteristics of the waste.
- Any contamination located in the trench backfill materials between one vaulted manhole location and another would be left in place.
- Monitoring of trench water would be accomplished through monitoring wells placed in the utility trench adjacent to the newly installed manholes and through wipe samples taken within the vaulted manholes. Two wells would be placed on either side of the four manholes for a total of eight monitoring wells. Sampling of the wells and the wipe samples from the vaults would occur quarterly. EPA would evaluate the effectiveness of the wipe sample collection method and adjust it as deemed necessary. EPA would also adjust the frequency of the monitoring and sampling events as deemed necessary.
- The monitoring wells outside the manhole vaults would be used to extract PCB oil if build up of oil against the new liner of the replaced vaulted manhole was observed. The monitoring wells would also provide data to support future decisions about a site-wide remedial action.
- Monitoring inside the drain would be performed in order to assess if free oil build had been reduced or eliminated compared to the conditions that existed prior to replacement of the vaults.
- Institutional controls would include both deed restrictions and assigning permit restrictions to accompany the deed restrictions. Deed restrictions would be necessary to restrict land use in order to ensure that the new vaults and liners and clean backfill are not compromised during excavation or other intrusive activities causing contaminated media from the adjacent pipe runs to enter the clean backfill and/or new vault.

Estimated Capital Cost (Design, Geotechnical Investigation and Construction): \$3,600,000

Estimated Construction Time: 8 weeks

Estimated Time to Achieve Remedial Objectives: Immediately upon completion of construction

Estimated Truck Trips: 10 excavation trucks, 10 clean fill trucks, and 1 asphalt truck

Estimated Annual O&M Cost (30 years): \$93,150

Total Present Value: \$5,200,000

Alternative 7: Excavation, Removal, and Replacement of Two Vaulted Manholes, M7179 and J01

Alternative 7, like Alternative 4, would reduce the volume of contamination and mitigate contaminant migration through excavation and removal of source materials and through infrastructure modifications. Under Alternative 7, only the two most highly-contaminated vaulted manhole locations (M7179 and J01) would be addressed. A sketch depicting Alternative 7 (at a single vaulted manhole) is shown in Figure 9. The major elements of Alternative 7 include the following:

- Excavation and removal of the vaulted manholes and surrounding impacted backfill materials at M7179 and J01, and proper off-site disposal of the contaminated materials.
- Prior to excavation, the vaulted manholes would be dewatered and flow in the TMD system would be temporarily rerouted with pumps.
- Two new vaulted manholes would be installed to replace the excavated vaulted manholes, including new stone bedding and backfill materials.
- Prior to installing the new vaulted manholes, a flexible synthetic liner would be installed on the open excavation surface to separate the existing soils from the new clean bedding and backfill materials.
- The flexible synthetic liner would be bolted to the outside of each new manhole vault using batten strips.
- Treatment of excavated impacted soils through solidification would occur prior to disposal by mixing a reagent (cement kiln dust) to convert the sludge to a granular solid and improve the handling characteristics of the waste.
- The PCB contamination at the base of the two downgradient vaulted manholes, M4335 and M7183, would be left in place. Any contamination located in the trench backfill materials between one vaulted manhole location and another would also be left in place.
- Monitoring of trench water would be accomplished through monitoring wells placed in the utility trench adjacent to the newly installed manholes and through wipe samples taken within the vaulted manholes. Two wells would be placed on either side of the two manholes for a total of four monitoring wells. Sampling of the wells and the wipe samples from the vaults would occur quarterly. EPA would evaluate the effectiveness of the wipe sample collection method and adjust it as deemed necessary. EPA would also adjust the frequency of the monitoring and sampling events as deemed necessary.
- The monitoring wells outside the manhole vaults would be used to extract PCB oil if build up of oil against the new liner of the replaced vaulted manhole was observed. The monitoring wells would also provide data to support future decisions about a site-wide remedial action.
- Monitoring inside the drain would be performed in order to assess if free oil build up had been reduced or eliminated compared to the conditions that existed prior to replacement of the two vaults.
- Institutional controls would include both deed restrictions and assigning permit restrictions to accompany the deed restrictions. Deed restrictions would be necessary to restrict land use in order to ensure that the new vaults and liners and clean backfill are not compromised during excavation or other intrusive activities causing contaminated media from the adjacent pipe runs to enter the clean backfill and/or new vault.

Estimated Capital Cost (Design, Geotechnical Investigation and Construction): \$2,600,000

Estimated Construction Time: 6 weeks

Estimated Time to Achieve Remedial Objectives: Immediately upon completion of construction

Estimated Truck Trips: 4 excavation trucks, 4 clean fill trucks, and 1 asphalt truck

Estimated Annual O&M Cost (30 years): \$76,866

Total Present Value: \$3,900,000

Discussion of Performance Standards for Remedial Alternatives

The high concentrations of PCB source materials that have accumulated around the base of the vaulted manholes, and that continue to migrate into the TMD system pipe, far exceed the typical range of PCB health-based cleanup standards. However, due to the interim nature and the objective of the intended action, none of the remedial alternatives include numeric cleanup standards for soil or any other media. This interim action is intended to serve as a source control action. The objective of the action is not to clean up soils (or other media) to specified health-based cleanup levels, but rather to mitigate contaminant migration and prevent further environmental degradation by addressing the high-concentration PCB source materials. For this reason, performance standards will be used during the remedial action instead of numeric cleanup standards.

Under Alternatives 4 and 7, performance standards for the excavation and removal of source materials adjacent to the vaulted manholes include but are not limited to:

- 1) *visual standards* – i.e., excavation of materials based on the observation of oily and/or impacted backfill and bedding materials beneath and adjacent to the vaults;
- 2) *depth standards based on lithological characteristics* – i.e., excavation up to 2 feet into the undisturbed native clay below the manhole vault and bedding materials. The native materials at the site are described as dense, semi-impermeable clay or silty clay. The soils observed in the utility corridor borings are either disturbed native soils or imported backfill materials, until the native soils beneath the utility corridors are encountered. During site characterization activities, low to no detections of PCBs were found in samples collected from within the undisturbed native clay.
- 3) *lateral-distance standards* – i.e., excavation of impacted materials located laterally from the vaulted manholes for a minimum of 5 feet in each direction outside the vaulted manhole or as deemed necessary during remedial design to properly connect the new manhole and the piping and for excavation bracing/safety.

Performance standards under Alternative 2 for solidification of source materials are *engineering performance standards* – i.e., to apply the grout in the backfill on all sides and beneath the vaulted manholes to sufficient depths above and below the source materials in order to significantly reduce the PCB mobility. The source materials adjacent to the vaulted manholes would be immobilized by injection of a grout mixture defined in the remedial design. Long-term monitoring of the presence of oil in the manholes would occur to measure the reduction in oils entering the drain.

EVALUATION OF ALTERNATIVES

The Superfund law requires EPA to use nine criteria to evaluate and compare cleanup alternatives. Each criterion is described below, followed by a discussion of how each alternative meets or does not meet each criterion. More details regarding the evaluation and comparison of the cleanup alternatives against the nine criteria can be found in the Focused FS. In addition, Table 1 provides a summary of EPA's evaluation of the cleanup alternatives against the nine criteria.

Section 121(b)(1) of CERCLA presents several factors that EPA is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial alternatives. The purpose of this evaluation is to promote consistent identification of the relative advantages and disadvantages of each alternative, thereby guiding selection of remedies offering the most effective and efficient means of achieving site cleanup goals. While all nine criteria are important, they are weighed differently in the decision-making process depending on whether they evaluate protection of human health and the environment or compliance with Federal and State requirements, standards, criteria, and limitations (threshold criteria); consider technical or economic merits (primary balancing criteria); or involve the evaluation of non-EPA reviewers that may influence an EPA decision (modifying criteria). Each of these nine criteria are described below

Explanation of the Nine Evaluation Criteria

Threshold Criteria

1. **Overall Protection of Human Health and the Environment** addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed by the site are eliminated, reduced or controlled through treatment, engineering, or institutional controls.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** addresses whether a remedy will meet the applicable or relevant and appropriate federal and state requirements.

Primary Balancing Criteria

3. **Long-Term Effectiveness and Permanence** refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met.
4. **Reduction of Toxicity, Mobility, or Volume Through Treatment** addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as their principal element. This preference is satisfied when treatment is used to reduce the principal threats at the site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.

5. **Short-Term Effectiveness** addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction of the remedy until cleanup levels are achieved. This criterion also considers the effectiveness of mitigative measures and time until protection is achieved through attainment of the remedial action objectives.
6. **Implementability** addresses the technical and administrative feasibility of a remedy from design through construction, including the availability of services and materials needed to implement a particular option and coordination with other governmental entities.
7. **Cost** includes estimated capital costs, annual operation and maintenance costs, and net present value of capital and operation and maintenance costs, including long-term monitoring.

Modifying Criteria

8. **State Agency Acceptance** considers whether the State support agency concurs with the selected remedy for the site.
9. **Community Acceptance** addresses the public's general response to the remedial alternatives and the preferred alternative presented in the Proposed Plan.

Each of the nine evaluation criteria are discussed below with respect to the alternatives under consideration for this interim action.

Comparison of Alternatives

1. Overall Protection of Human Health and the Environment

It is important to note that none of the potential remedial alternatives fully reduce the risks to human health and the environment that may already exist due to the known recontamination of the sediments in the Lange and Revere Street canals. The objective of this interim action is to mitigate contaminant migration and prevent further environmental degradation – in other words, to keep the contamination in the canal sediments from getting worse. This interim action will contribute to the long-term protection of human health and the environment.

Alternative 1, the “No Action” alternative, would not provide interim protective source control measures to mitigate the migration of PCB contamination and prevent further environmental degradation because it would continue to allow the infiltration and ongoing release of high-concentration PCB source materials from the subsurface soils near and around the bottom of the vaulted manholes into the TMD system and, ultimately, the canals.

In terms of this interim action, Alternatives 2, 4, and 7 would provide interim source control measures to mitigate the migration of PCB contamination and prevent further environmental degradation. Alternative 2 would prevent the high-concentration PCB source materials beneath the vaulted manholes from infiltrating into the TMD system and would reduce future contaminant migration by encapsulating the source materials. Alternatives 4 and 7 would prevent infiltration into the TMD system and reduce contaminant migration by excavating and removing the PCB source materials beneath the vaulted manholes, along with the impacted

backfill and bedding materials. Alternatives 2, 4 and 7 would be interim actions only and would provide adequate steps to reduce the volume of PCBs discharged into the canals until a final remedy is implemented.

2. Compliance with ARARs

Section 121(d) of CERCLA requires that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations which are collectively referred to as “ARARs,” unless such ARARs are waived under CERCLA section 121(d)(4). Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances found at a CERCLA site. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those state standards that are identified in a timely manner, and are more stringent than federal requirements, may be relevant and appropriate.

In accordance with the NCP (40 CFR 300.430(f)(1)(ii)(C)(1), interim actions such as this are not required to comply with ARARs as long as the final remedial action at the site will attain them. Alternative 1 does not meet ARARs. Alternatives 2, 4, and 7 are expected to comply with the state and federal ARARs that are specific to the limited scope of the proposed action. The primary ARARs to be met relate to federal requirements under the Toxic Substances Control Act (TSCA), erosion controls during excavation, compliance with hazardous waste transportation and disposal requirements, and air pollution emission requirements. A list of the potential ARARs for the limited scope of this interim action can be found in Table 2. Upon the completion of the site-wide RI/FS, EPA will propose a remedial action to address the entire site. Any interim remedial action selected as a result of this Proposed Plan may become part of the site-wide remedial action. ARARs will be further evaluated as a part of the final remedy for the site, and the final site-wide remedial action will attain ARARs.

3. Long-term Effectiveness and Permanence

The long-term effectiveness and permanence of the alternatives are evaluated in terms of how well an option will work over the long term, including how safely remaining contamination can be managed. Alternatives 4 and 7 are considered to have the greatest degree of long-term effectiveness and permanence because the source materials beneath the vaulted manholes would be removed. Alternative 4 would remove and replace all four vaulted manholes, while Alternative 7 would remove and replace only the two most highly contaminated vaulted manholes. Source materials at those vaulted manhole locations would be removed and monitoring wells would be installed in the utility trench adjacent to the newly installed vaults. The monitoring wells would be used to extract PCB oil if build up of soil against the new liner of replaced vaulted manhole was

observed. Compared to Alternatives 4 and 7, the degree of long-term effectiveness and permanence of Alternative 2 is not as great, since solidification is the primary component of the action and the source materials would not be removed. Institutional controls would be required for Alternatives 2, 4, and 7 to restrict future land use activities that would interfere with or adversely affect the integrity or protectiveness of the remedial action. Alternative 1 does not achieve or contribute to long-term effectiveness and permanence.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Alternative 1 would not utilize treatment to reduce the toxicity, mobility, or volume of the contaminants. The NCP preference for treatment would be met with Alternative 2, which utilizes in-situ treatment through solidification of impacted soils. The NCP preference for treatment would also be met with Alternatives 4 and 7, which utilize ex-situ treatment by mixing a reagent (cement kiln dust) with the impacted soils, converting the sludge to a granular solid to improve the handling characteristics of the waste. Immobilization of the impacted soils through solidification reduces mobility of waste, but does not significantly reduce toxicity or volume of wastes.

5. Short-term Effectiveness

Short-term impacts of the alternatives increase as more source area soils around the vaulted manholes are excavated and as more clean soil must be brought to the site. Longer construction times and greater amounts of off-site soil disposal will result in greater potential for worker injury and greater amounts of community disturbance related to transporting contaminated soil off-site. Alternative 1 has no action associated with it so would have no associated impacts. Alternative 2 has the shortest construction period (3 weeks) and the least amount of truck traffic since excavation or clean-fill trucks are not required. Dust generated during construction activities would be from clean materials and particulates could be readily monitored and controlled through dust suppression methods.

Alternative 4 has the greatest short-term impacts because it has the longest construction period (8 weeks) and requires the largest number of trucks to transport materials to and from the site and through populated areas. Alternative 4 would require an estimated 10 excavation trucks, 10 clean fill trucks, and 1 asphalt truck, while Alternative 7 would take 6 weeks to construct and would require 4 excavation trucks, 4 clean fill trucks, and 1 asphalt truck. The exposures associated with Alternatives 4 and 7 could be addressed through proper decontamination and properly functioning tarp systems on trucks, dust monitoring and suppression during construction, and appropriate erosion control measures.

For all action alternatives, evaluation of long-term monitoring results would be required after construction to evaluate if RAOs were achieved.

6. Implementability

Alternative 1 has no actions that would be implemented. All of the action alternatives can be implemented with readily available materials and methods. The main technical challenge for

Alternatives 4 and 7 is deep excavation and the need for sheet piling and shoring. The main technical challenge for Alternative 2 is the selection of the proper grouting technique. These challenges could be overcome through effective planning and design.

7. Cost

This criterion evaluates the capital costs (design, geotechnical investigation, and construction costs) operation and maintenance costs of each alternative. Present-worth costs have been calculated to help compare costs among alternatives with different implementation times. Alternative 1 would cost nothing. Alternative 2 is the least expensive action alternative (\$3.7 million present worth cost) with a capital cost of \$1.8 million. Alternative 7 is the next most costly alternative (\$3.9 million present worth cost) with a capital cost of \$2.6 million. Alternative 4 is the most costly alternative (\$5.2 million present worth cost) with a capital cost of \$3.6 million. A final cost estimate for the selected action will be developed and refined during the remedial design process.

8. State/Support Agency Acceptance

The Michigan Department of Environmental Quality supports Alternative 7 as the preferred interim remedial action.

9. Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be discussed in the Interim ROD.

PREFERRED ALTERNATIVE

Based on the evaluation above, EPA believes that Alternative 7 is the most appropriate interim cleanup alternative for the Ten-Mile Drain Site at this point in the Superfund remedial process. The preferred interim remedy consists of:

- 1) Excavation and removal of the vaulted manholes and surrounding impacted backfill materials at M7179 and J01, and proper off-site disposal of the contaminated materials;
- 2) Dewatering and temporary rerouting of the flow in the TMD system prior to excavation work;
- 3) Installation of two new vaulted manholes at M7179 and J01, including replacement of the stone bedding and backfill materials;
- 4) Installation of a flexible synthetic liner on the open excavation surfaces prior to installation of the new vaulted manholes, to separate the existing soils from the new clean bedding and backfill materials;
- 5) After installation of the new vaulted manholes, a flexible synthetic liner would be bolted to the outside of each new manhole vault and the piping using batten strips;

- 6) Treatment of excavated impacted soils through solidification prior to disposal by mixing a reagent (cement kiln dust) to convert the sludge to a granular solid and improve the handling characteristics of the waste;
- 7) Installation of two monitoring wells on either side of the two new vaulted manholes for a total of four monitoring wells. The monitoring wells would be placed in the utility trench adjacent to the newly installed structures.
- 8) Quarterly monitoring of both the utility trench water outside the drain through the monitoring wells and the water inside the drain, extraction of PCB oil using the monitoring wells if build up of oil occurs against the new liner of the replaced vaulted manhole. EPA would evaluate the effectiveness of its sample collection methods as well as the frequency of the monitoring and sampling events and adjust them as necessary; and
- 9) Use of institutional controls to prevent actions that compromise the remedy.

Under the preferred interim remedy, the PCB contamination at the base of the two downgradient vaulted manholes, M4335 and M7183, would be left in place. Any contamination located in the trench backfill materials between one vaulted manhole location and another would also be left in place.

The State of Michigan supports Alternative 7 as the preferred alternative.

Summary of Rationale for the Preferred Alternative

EPA believes that Alternative 7 represents the best balance of the evaluation criteria and that this alternative will be a protective interim action that provides adequate steps to reduce the volume of PCBs discharging into the canals. Alternative 7 will remove the PCB source materials and the highly-impacted bedding and backfill materials at vaulted manholes M7179 and J01, leaving the PCB contamination at the base of the two downgradient vaulted manholes, M4335 and M7183, to be addressed as part of the final site-wide remedy for the Ten-Mile Drain Site. Alternative 7 will comply with those federal and state requirements that are applicable or relevant and appropriate for this limited-scope action, will be cost effective, utilize treatment permanent solutions and alternative treatment technologies to the maximum extent practicable, and satisfy the preference for treatment as a principal element.

Alternative 7 is expected to meet the RAO of mitigating the migration of PCB contamination and preventing further environmental degradation of the Lange and Revere Street canal sediments immediately upon completion of the construction work. The infiltration of PCB oil and contaminated utility trench water into the TMD system pipe is expected to be reduced by removing the high concentrations of PCBs at M7179 and J01, thereby preventing these high concentrations from moving through the TMD system to the canals.

A variety of factors go into EPA's preference for Alternative 7 over the other interim alternatives. Based on the information available at this time, EPA believes that the highest concentrations of PCBs have accumulated around the base of vaulted manholes M7179 and J01, and that this is the source material that continues to release into the TMD system. Further, EPA believes that the continued release of this material is the cause of the contamination present at the

base of the downgradient vaulted manholes, M4335 and M7183, as well as the residual contamination found throughout the TMD system. In addition, removing and replacing only the two most highly-contaminated vaults instead of all four vaults will reduce the construction period, the number of truckloads, and create less traffic disturbance.

The Source Area Investigation results discussed in the “Summary of Site Risks” section of this Proposed Plan show an order of magnitude difference in the PCB concentrations found in the borings from 15 feet bgs, with 66,000 ppm adjacent to vaulted manhole M7179 compared to 1,500 ppm at vaulted manhole M4335. Additionally, during monthly source control activities at M7179, PCB oil-saturated snares inside the pipe are routinely removed and replaced, with PCB oil concentrations consistently greater than 100,000 ppm, and sometimes as high as 470,000 ppm. EPA believes that the removal and replacement of vaulted manholes M7179 and J01 will ultimately remove the major source materials and that, over time, monitoring results will reveal a reduction in the presence of PCB oil within the TMD system.

EPA also believes that the information obtained during the construction and implementation of Alternative 7 will continue to solidify the conceptual site model for the Ten-Mile Drain Site and will provide valuable information to inform EPA’s future decisions about the final site-wide remedy and or future interim remedy. As noted earlier, EPA is managing the contamination at the Ten-Mile Drain Site through a phased approach. Each phase or interim action provides valuable information that increases decisional flexibility and allows EPA to adapt future decisions based on the new information gained. This adaptive management approach is expected to result in cost savings and operational efficiencies over the long term, and to decrease uncertainties associated with remedy selection for later phases of the project.

Next Steps

EPA, in consultation with the MDEQ, will evaluate public reaction to the preferred interim cleanup alternative during the public comment period before deciding on a final interim cleanup alternative. EPA will hold a public meeting during the public comment period to present the proposed cleanup plan to the public, answer questions about the alternatives that were evaluated, and accept public comments. Based on new information or public comments, EPA may modify its preferred alternative or choose another. EPA therefore encourages the public to review and comment on all of the cleanup alternatives.

EPA will respond in writing to all significant comments in a Responsiveness Summary which will be part of the final Interim Record of Decision. EPA will announce the selected interim cleanup alternative in local newspaper advertisements and will place a copy of the Interim ROD in the local information repositories.

FIGURE 4

Weir Location Map

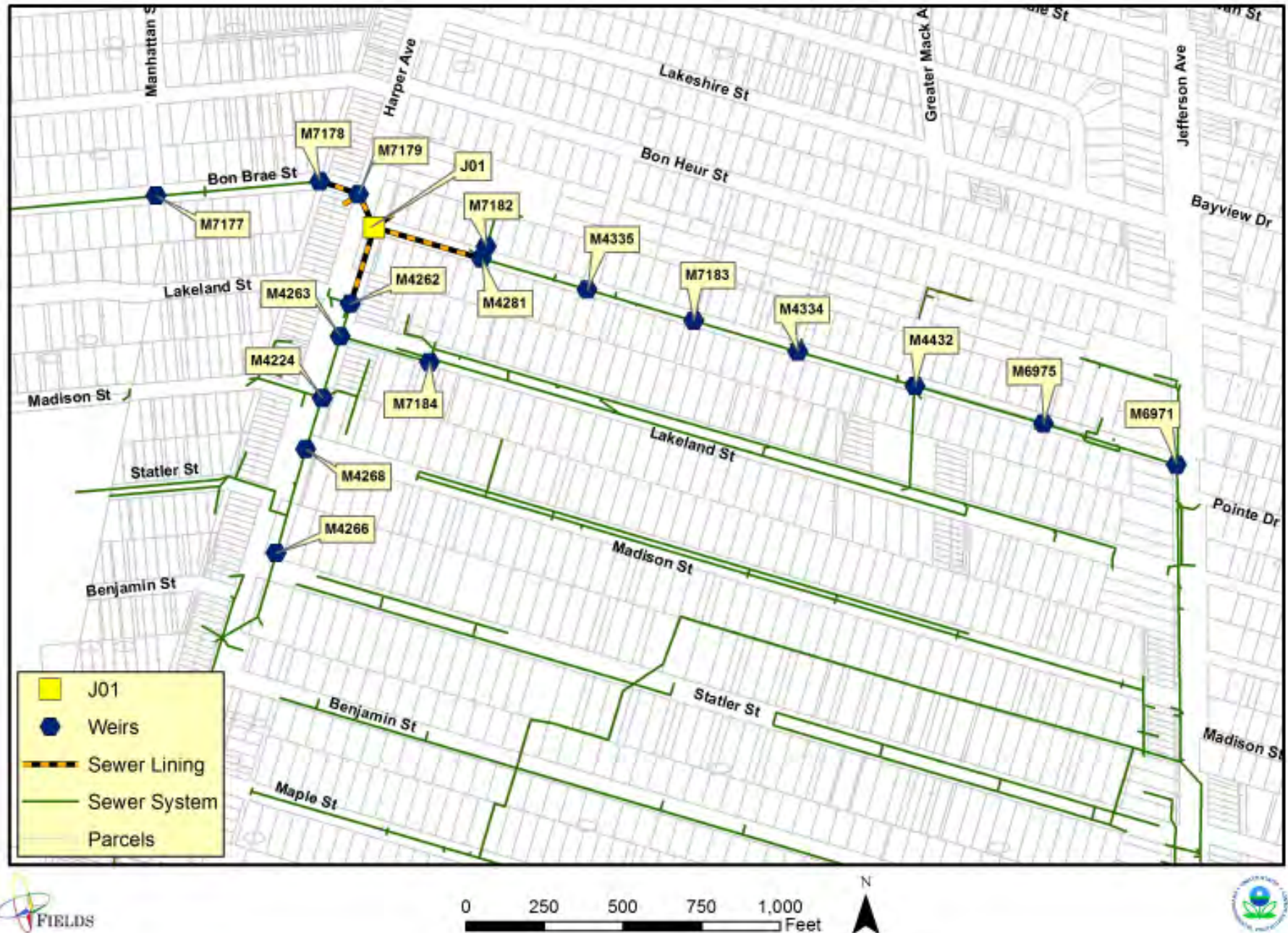
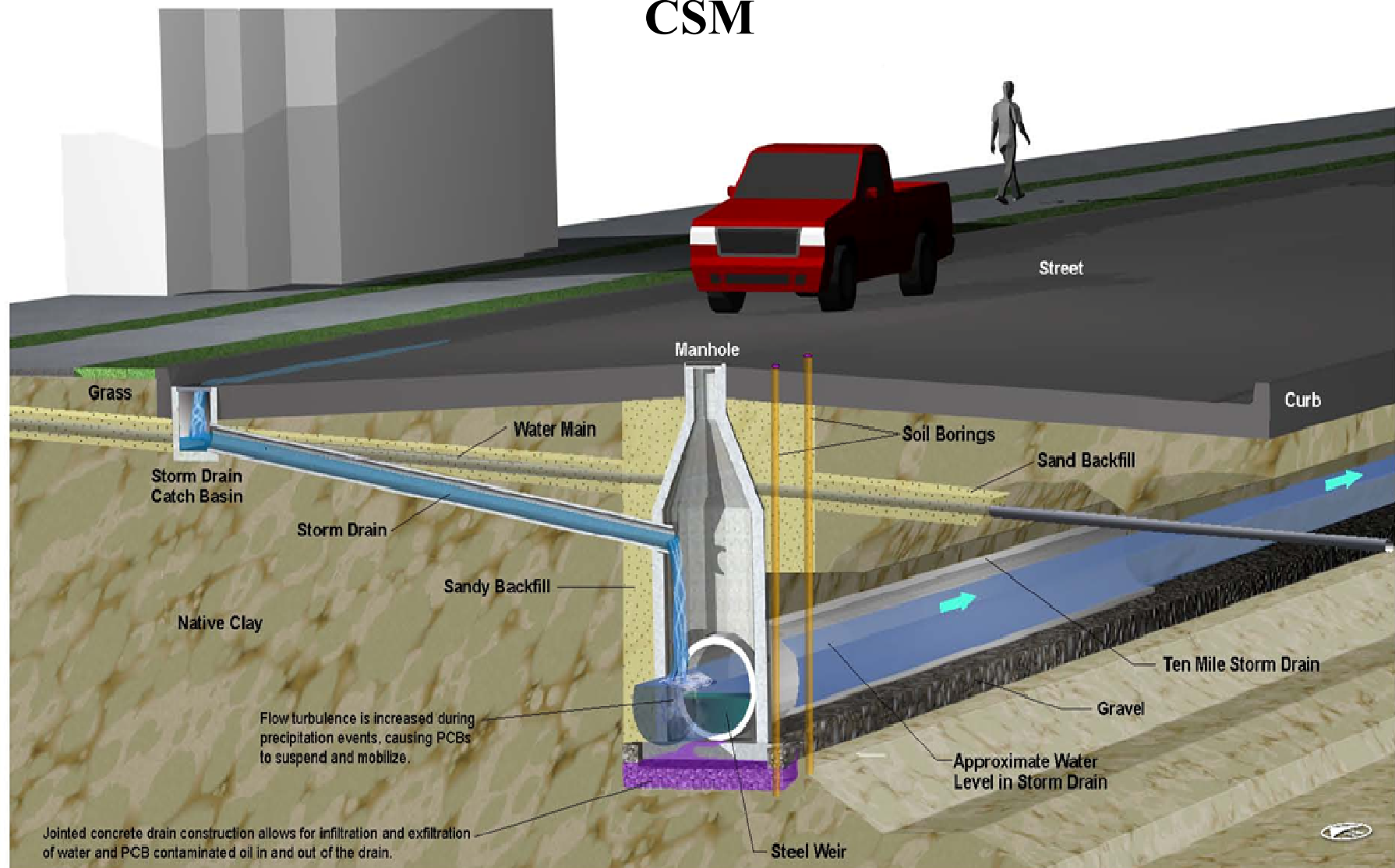


Figure 5a

CSM



LEGEND

-  Normal Stormwater Flow Direction
-  PCB Contaminated Gravel Backfill
-  Gravel Backfill

FIGURE 16—PCB Migration Model
 Ten-Mile Drain Site
 St. Clair Shores, Michigan

FIGURE 5b
CSM

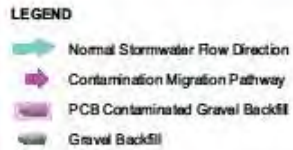


FIGURE 14—PCB Migration Model
Ten-Mile Drain Site
St. Clair Shores, Michigan

FIGURE 6

Location of 4 Vaulted Manholes

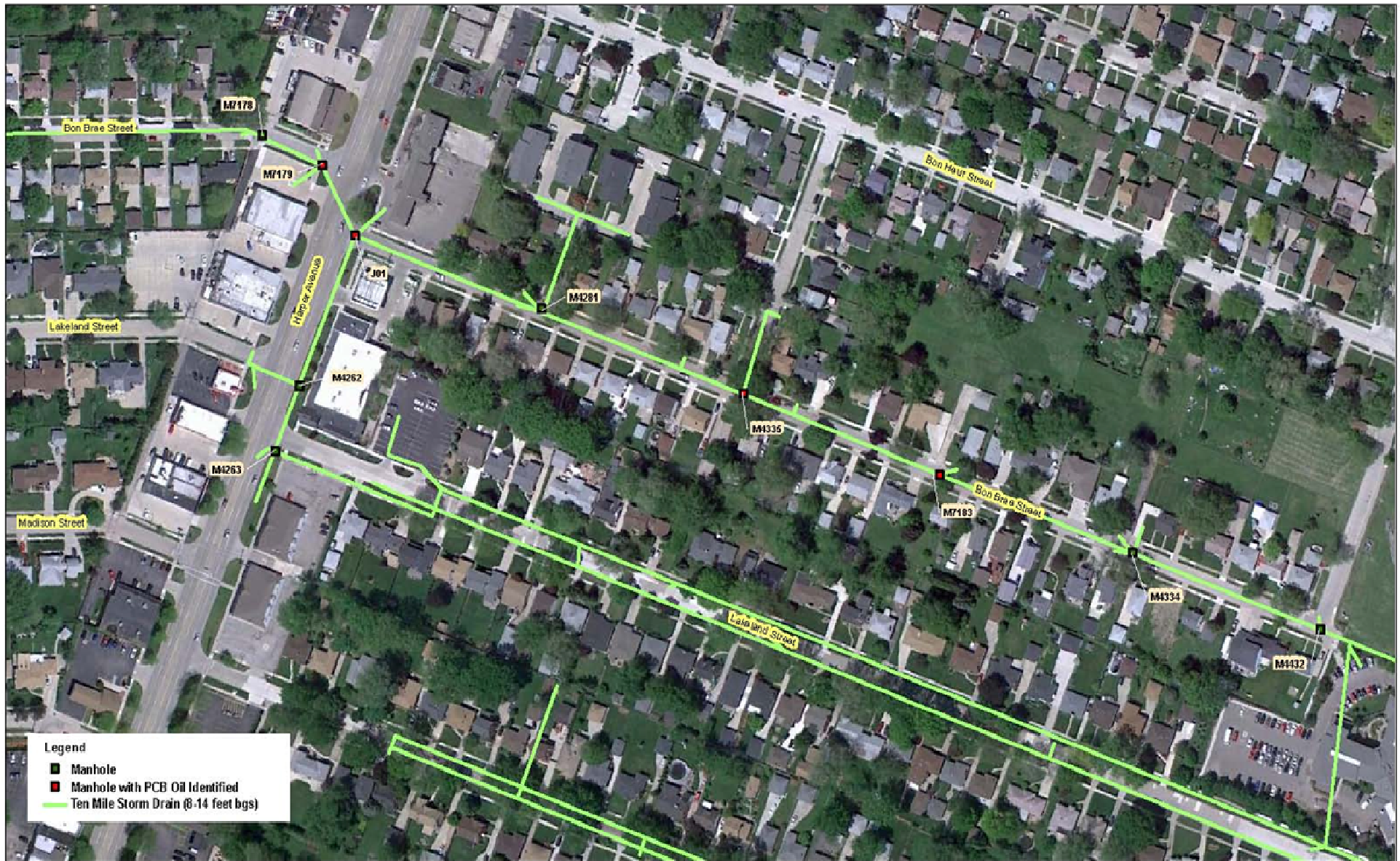


FIGURE 14
Manhole Vault Locations
Ten Mile Drain Source Area Investigation
Saint Clair Shores, Michigan

FIGURE 7. January 2013 - September 2013 Source Control Sampling Results



FIGURE 8 Alternative 2

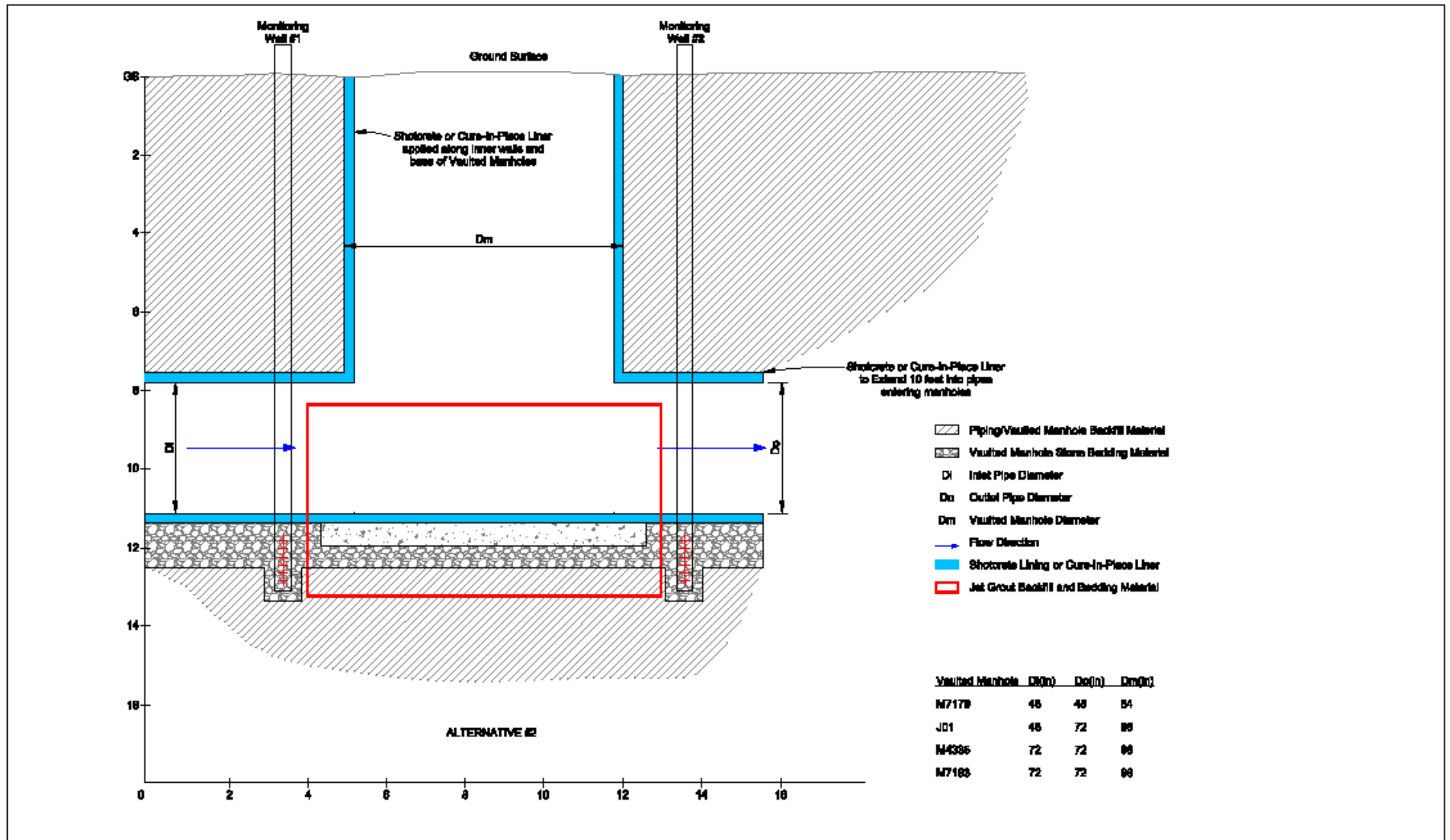


FIGURE 8
Alternative 2 - Grouting of Backfill Materials and Installation
of a Liner in Each of the Four Vaulted Manholes
Focused Feasibility Study
Ten-Mile Drain
Saint Clair Shores, Michigan

FIGURE 9

Alternative 4 and 7 Installation Detail

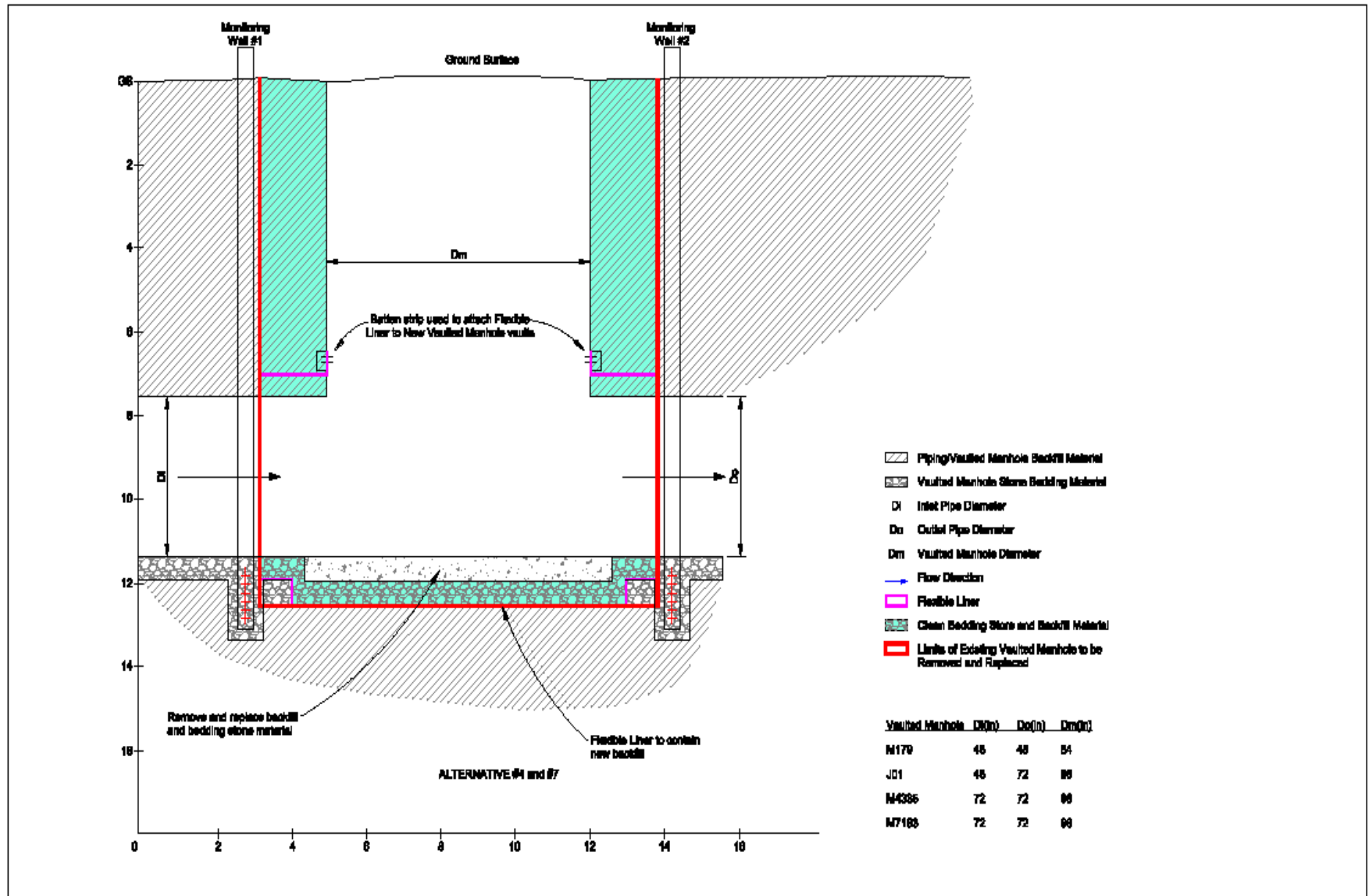


FIGURE 9
Alternative 4 and 7 - New Vaulted Manhole Installation Detail
Focused Feasibility Study
Ten-Mile Drain
Saint Clair Shores, Michigan

Table 1: Chart comparing cleanup options with the nine Superfund interim remedy selection criteria

	Alt 1	Alt 2	Alt4	Alt7*
Evaluation Criterion				
Overall Protection of Human Health and the Environment	○	●	●	●
Compliance with ARARs	○	●	●	●
Long-term Effectiveness and Permanence	○	⊙	●	⊙
Reduction of Toxicity, Mobility, or Volume through Treatment**	○	●**	●**	●**
Short-term Effectiveness	○	●	●	●
Implementability	○	●	●	●
Capital Cost (\$ millions)	\$0	\$1.8	\$3.6	\$2.6
State Acceptance	The State supports the preferred Alternative 7			
Community Acceptance	Will be evaluated after the public comment period			

● Fully meets criterion ⊙ Partially meets criterion ○ Does not meet criterion

* EPA's preferred alternative

**Solidification of impacted media reduces PCB mobility, but will not significantly reduce toxicity or volume of wastes.

TABLE 2

Potentially Applicable or Relevant and Appropriate Requirements and To-Be-Considered Standards*Interim Action, Ten-Mile Drain Superfund Site, St. Clair Shores, Michigan*

Regulation	Requirement	ARAR Status	Analysis
Chemical-specific Applicable or Relevant and Appropriate Requirement (ARARs)			
<i>Soil</i>			
40 CFR 761.61 – Toxic Substances Control Act (TSCA) Regulations	Establishes requirements and thresholds for remediation of PCBs.	Relevant and Appropriate	Relevant and appropriate for establishing remedial goals for soil. Requirements are not binding on CERCLA sites 761.61 (a)(1)(ii)).
Location-specific ARARs			
15 CFR 930 – Coastal Zone Management	Requires that federal agencies conducting activities directly affecting the coastal zone conduct those activities in a manner that is consistent, to the maximum extent practicable, with approved state coastal zone management programs.	Applicable	Applicable to construction in the coastal zone. Onsite CERCLA actions are exempt from permitting and administrative reviews; however, the substantive requirements of a performing a consistency determination must be met.
50 CFR 17 – Threatened and Endangered Species Protection	Requires that federal agencies ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify critical habitat.	Applicable	Applicable for action that is likely to jeopardize fish, wildlife, or plant species or destroy or adversely modify critical habitat.
16 United States Code (USC) 703 – Migratory Bird Treaty Act	Protects almost all species of native birds in the United States from unregulated taking.	Applicable	Applicable if migratory birds, or their nests or eggs, are identified at the site at anytime. Operations will not destroy the birds, nests, or eggs.
Action-specific ARARs			
49 CFR 100-109 – Hazardous Materials Transportation	Established standards for packaging, labeling, and transportation of hazardous materials	Applicable	The onsite area encompasses public rights-of-way. Should hazardous materials be generated and require onsite transportation on a public right-of-way, the substantive requirements of the regulations must be complied with.
R 299.9302 – Hazardous Waste Determination	Generators of any waste must determine, either through knowledge or testing, whether the waste is a hazardous waste regulated under these rules.	Applicable	Applicable to all wastes managed onsite. Determining whether wastes qualify as hazardous will often establish the applicability of other regulations.
R 299.9305 – Pre-transport Requirements	Establishes minimum standards for preparing hazardous waste for shipment offsite.	Applicable	Applicable if hazardous waste is generated and managed onsite prior to offsite disposal.
R 299.9306 – Accumulation Time	Establishes minimum standards for managing hazardous wastes onsite. The requirements of 40 CFR 265 are incorporated by reference.	Applicable	Applicable if hazardous waste is generated and managed onsite prior to offsite disposal.
40 CFR 265, Subparts I and J – Use and Management of Containers and Tank Systems	Subpart I sets operating and performance standards for storage of hazardous waste in containers under generator accumulation rules.	Applicable	Applicable if hazardous waste is generated and managed in containers onsite prior to offsite disposal.

TABLE 2

Potentially Applicable or Relevant and Appropriate Requirements and To-Be-Considered Standards*Interim Action, Ten-Mile Drain Superfund Site, St. Clair Shores, Michigan*

Regulation	Requirement	ARAR Status	Analysis
R 323, Parts 4, 8, and 21	Sets requirements for onsite discharges of industrial wastewater as well as industrial and construction stormwater.	Applicable	Applicable only if wastewater or stormwater that has not contacted contaminated media requires discharge during remedial operations at the site. The current remedial design includes containerization and offsite disposal of all water that contacts contaminated media during the execution of the remedial action.
40 CFR 761.65 – Storage for Disposal	Bulk PCB remediation waste containing greater than 50 milligrams per kilogram PCBs may be stored onsite for up to 180 days, provided controls are in place for prevention of dispersal by wind or generation of leachate. Storage site requirements include a foundation below the liner, a liner, a cover, and a run-on control system.	Applicable	Applicable if soils with PCBs greater than 50 milligrams per kilogram are excavated and managed in stockpiles onsite. An extension on the 180-day storage limit is allowed.
R 323.2210(u) – Groundwater Quality	Allows discharges to groundwater associated with remedial actions.	Applicable	Applicable if injections of grout/surfactant will impact groundwater during the remedial action. CERCLA actions are exempt from administrative requirements, including administrative reviews and permitting.
R 323.2204 – Groundwater Quality	Establishes requirements for discharges that will impact groundwater.	Applicable	Applicable if injections of grout/surfactant will impact groundwater during the remedial action. CERCLA actions are exempt from administrative requirements including administrative reviews and permitting.
40 CFR 144; 146, Subpart F – Underground Injection Control Program	Regulates the subsurface emplacement of fluids through the Underground Injection Control Program, which governs the design and operation of five classes of injection wells in order to prevent contamination of underground sources of drinking water. The Underground Injection Control Program regulates well construction, well operation, and monitoring.	Applicable	Applicable to grout injections to the subsurface.
R 299.3315 – PCB Storage, Handling, and Transportation	Establishes requirements for storage containers, bulk transportation trucks, and handling equipment used when managing wastes containing PCBs.	Applicable	Applicable to handling PCB-contaminated soil and debris onsite.

TABLE 2

Potentially Applicable or Relevant and Appropriate Requirements and To-Be-Considered Standards*Interim Action, Ten-Mile Drain Superfund Site, St. Clair Shores, Michigan*

Regulation	Requirement	ARAR Status	Analysis
R 323.1709 – Erosion and Sediment Control	Establishes requirements for the control of erosion and sedimentation during earth change operations.	Applicable or Relevant and Appropriate	Relevant and appropriate to the excavation of highly contaminated soil. Applicable if more than one acre will be disturbed or for any disturbance within 500 feet of the water's edge of a lake or stream. Onsite CERCLA actions are exempt from administrative requirements such as administrative reviews and permitting; however, the substantive requirements must be met.
R 336.1372(8)(b) – Control of Fugitive Dust	Establishes common measures to mitigate the generation of fugitive dust during small construction work.	Relevant and Appropriate	Relevant and appropriate for remedial actions where contaminated soil may become airborne. Onsite CERCLA actions are exempt from administrative requirements such as administrative reviews and permitting; however, the substantive requirements must be met.
To-be-Considered (TBC) Criteria			
CERCLA Guidance on Land Use in the CERCLA Remedy Selection Process	Establishes appropriate considerations in defining future land use.	TBC	Provides guidance to EPA in selecting land use for remedy selection purposes.
Remediation and Redevelopment Division Operational Memorandum No. 4, Site Characterization and Remediation Verification, Attachment 9 – In Situ Remedial Discharges	Guidance for the implementation of in situ technologies that involve discharges to groundwater or waters of the state.	TBC	Considered as guidance.
Michigan Occupational Safety and Health Act Public Act 154 of 1974, as amended Michigan Administrative Code: <ul style="list-style-type: none"> ▪ Safety Standards for General Industry ▪ Health Standards for General Industry ▪ Safety Standards for Construction ▪ Health Standards for Construction ▪ Administrative Rules for General Industry, Construction Health, and Agricultural Operations (R 408.1001-1094) 	Occupational safety and health standards adopted to provide safe and healthful employment or places of employment, which may include medical monitoring. Provides safety standards for hazards, air contaminants, physical hazards, health hazard control measures, illumination, sanitation, employee right-to-know, and others. Regulations containing worker health and safety standards for construction and general industry operations and requirements for worker training—specifically, “Hazardous Waste Operations and Emergency Response (HAZWOPER).” This statute is adopted by Michigan from the Federal Occupational Safety and Health Act. Rules contain a list of permissible exposure limits in the work place for more than 600 chemical compounds.	TBC	Onsite remedial actions have the potential to expose workers to contaminants found in affected media (soil, air, and water). Construction, excavation and other site actions may present potential health hazards to nearby workers. Human labor will likely be required to construct remedial systems as well as provide long-term routine/non-routine maintenance on the systems. Such activities are governed by worker safety and health standards under this act and are applicable to all site actions and activities.

TABLE 2

Potentially Applicable or Relevant and Appropriate Requirements and To-Be-Considered Standards*Interim Action, Ten-Mile Drain Superfund Site, St. Clair Shores, Michigan*

Regulation	Requirement	ARAR Status	Analysis
Michigan Motor Carrier Safety Act of 1963 Public Act 181 of 1963, as amended (MCL 480.11, <u>et seq.</u>) Michigan Administrative Code: Transportation of Hazardous Materials (R 480.11-25).	Rules governing the transportation of hazardous materials.	TBC	Used to protect the public, first responders to hazardous incidents and the environment from hazardous materials.
Part 17, Michigan Environmental Protection Act, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) (MCL 324.1701, <u>et seq.</u>) Michigan Administrative Code: R 324.1701, <u>et. seq.</u> ; Formerly known as Act 127 (1970)	Provides for the protection of natural resources. The protection of state resources prohibits any action that pollutes, impairs, or destroys the state's natural resources, due to any activities conducted at a site of environmental contamination.	TBC	Applied in remedial investigation, remedial design, response activity and remedial action activities.
Part 31, Water Resources Protection, of The NREPA, 1994 PA 451, as amended (MCL 324.3104, <u>et seq.</u>) Michigan Administrative Code: R 324.3103, <u>et. seq.</u> Part 1: General provisions provide purpose— that is, implementation of the act and definitions (R 323.1001, <u>et. seq.</u>) Part 4: Michigan water quality standards for surface waters to protect public health and welfare, enhance and maintain water quality, and protect the state's natural resources (R 323.1041-1117) Part 5: Spillage of oil and polluting materials addresses spill containment, prevention, cleanup, and reporting (R 323.1158, <u>et. seq.</u>) Part 6: Cleaning agents and water conditioners (R 323.1171, <u>et. seq.</u>) Part 8: Water quality based effluent limits for toxic chemicals (R 323.1201-1221) Part 9: Wastewater Reporting (R 299.9001, <u>et. seq.</u>)	These rules address discharges to both surface waters and groundwater of the State. Part 31 prohibits direct or indirect discharge to ground or surface waters of the state that are or may become injurious to the environment or public health. Regulates water and wastewater discharges with standards for discharge to groundwater. Defines effluent guidelines based on actual water quality, receiving stream properties, and other appropriate water quality criteria. Provides criteria and standards for the National Pollutant Discharge Elimination System and effluent standards for toxic pollutants. This is the implementing statute for the federally delegated National Pollutant Discharge Elimination System program.	TBC	Remedial action may result in the discharging of remediated and non-remediated contaminated groundwater into waters of the state—that is, groundwater, surface water, or any other water course. Applicable for remedial alternatives which will treat and/or discharge wastewater to surface waters of the state. Cites specific requirements for the discharge of bioaccumulative chemicals. Discharge requirements can be identified through a substantive requirements document. Prevents concentrations in surface water of taste and odor producing substances. Prevents acutely and chronically toxic substances from entering surface water based on the LC50 toxicity criteria. Prevents degradation of water quality. Restricts levels of turbidity, color, oil films, floating solids, foams, settling and suspended solids, and deposits.

TABLE 2

Potentially Applicable or Relevant and Appropriate Requirements and To-Be-Considered Standards*Interim Action, Ten-Mile Drain Superfund Site, St. Clair Shores, Michigan*

Regulation	Requirement	ARAR Status	Analysis
<p>Part 10: Treatment plant operators</p> <p>Part 21: Wastewater discharge permits identifies National Pollutant Discharge Elimination System and State groundwater discharge requirements, including procedures for permit application, permit issuance, and denial (R 323.2106, R 323.2108-9, R 323.2114, R 323.2117-2119, R 323.2128, R 323.2136, R 323.2145, R 323.2149-2151, R 323.2154-2155, R 323.2162-2164, and R 323.2190-2192)</p> <p>Part 22: Groundwater quality rules R 323.2201-2240); and Part 23: Pretreatment (R 323.2301 <u>et seq.</u>). Formerly known as Act 245 (1929)</p>			
<p>Part 115, Solid Waste Management, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. (MCL 324.115, <u>et seq.</u>)</p> <p>Michigan Administrative Code: R 324.11501, <u>et seq.</u>; Formerly known as Act 641 (1978)</p>	<p>Addresses solid waste management including general landfill design requirements as promulgated in the administrative rules of the Michigan Solid Waste Management Regulations. Regulates the construction and operation of sanitary landfills, solid waste transfer facilities, and solid waste processing plants. Specifies liner and capping requirements for solid waste landfills. Requirements for the operation and closure of non-hazardous waste treatment, storage, and disposal and groundwater quality performance standards. Also imposes geographic limitations on where non-hazardous solid waste can be disposed of.</p>	TBC	<p>Regulates the disposal of non-hazardous solid waste. Provides requirements for closure and post-closure of non-hazardous solid waste treatment, storage, and disposal facilities. Provides groundwater quality performance standards. Remedial action may produce non-hazardous solid waste, which must be disposed of in accordance with Part 115. Used for determining the process and type of disposal facility that solid waste or contaminated media may be removed to. May apply to closure (capping) of a landfill. May serve as a basis of design for containment of non-hazardous solid waste onsite.</p>
<p>Part 121, Liquid Industrial Wastes, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. (MCL 324.121, <u>et seq.</u>)</p> <p>Michigan Administrative Code: R 324.12101, <u>et seq.</u>; Formerly known as Act 136 (1969)</p>	<p>Regulates liquid industrial waste generators, transporters and designated facilities. Transporters are required to be registered and permitted in accordance with the hazardous materials transportation act. Requires a registered and permitted liquid industrial waste transporter to remove any liquid waste offsite. Records are required to be kept by those who generate such waste, under Section 3a. Liquid industrial waste is defined as “any liquid waste, other than unpolluted water.”</p>	TBC	<p>Remedial action may require the storage, transportation and disposal of liquid industrial wastes. Applies to the on- and offsite management of liquid industrial wastes.</p>

TABLE 2

Potentially Applicable or Relevant and Appropriate Requirements and To-Be-Considered Standards*Interim Action, Ten-Mile Drain Superfund Site, St. Clair Shores, Michigan*

Regulation	Requirement	ARAR Status	Analysis
Part 201, Environmental Remediation, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. (MCL 324.201, <u>et seq.</u>) Michigan Administrative Code: R 299.5511(3)(d), <u>et. seq.</u> ; Formerly known as Act 307 (1982)	In part, protects the environment and natural resources of the state; regulates the discharge of certain substances into the environment; regulates the use of certain lands, waters, and other natural resources of the state; and prescribes the powers and duties of certain state and local agencies and officials.	TBC	Establishes cleanup criteria for sites of environmental contamination based on current and future land use. Regulates cleanup of releases of hazardous substances in concentrations that constitute a facility as that term is defined in Section 20101(o) of Act 451 to soil and groundwater.
Part 327, Great Lakes Preservation, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. (MCL 324.327, <u>et seq.</u>) Michigan Administrative Code: R 324.32701, <u>et. seq.</u>	The waters of the state are valuable public natural resources held in trust by the state, and the state has a duty as trustee to manage its waters effectively for the use and enjoyment of present and future residents and for the protection of the environment. The waters of the Great Lakes within the boundaries of this state shall not be diverted out of the drainage basin of the Great Lakes.	TBC	May be applied to site remediation that would affect the diversion or consumptive use of waters of the Great Lakes.
Part 329, Great Lakes Protection, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. (MCL 324.329, <u>et seq.</u>) Michigan Administrative Code: R 324.32901, <u>et. seq.</u>	Careful management of the Great Lakes will permit the rehabilitation and protection of the lakes, their waters, and their ecosystems, while continuing and expanding their use for industry, food production, transportation, and recreation.	TBC	May be applied to site remediation that would affect the Great Lakes.
Part 401, Wildlife Conservation, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. (MCL 324.401, <u>et seq.</u>) Michigan Administrative Code: R 324.40102, <u>et. seq.</u>	Regulates wildlife conservation.	TBC	May be applied to identifying wildlife habitat near environmental sites of contamination where an ecological risk assessment(s) may be conducted. May be used in conjunction with the Michigan Features Inventory List to identify habitat where an environmental site of contamination may impact wildlife.
Part 411, Protection and Preservation of Fish, Game, and Birds, of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. (MCL 324.411, <u>et seq.</u>) Michigan Administrative Code: R 324.41101, <u>et. seq.</u>	Regulates the protection and preservation of fish, game, and birds.	TBC	May be applied to site remediation to protect and preserve fish, game, and birds.